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ABSTRACT

This document provides descriptions of the 2000, 2001, and 2002 winners of the Environmental Protection Agency's Indoor Air Quality Tools for Schools Excellence Awards. The winners are considered to be national leaders in improving indoor air quality in schools. Also included are case studies for selected 2000 winners and a press release for the 2001 awards. (EV)

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IAQ Tools for Schools Awards 2000-2002

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IAQ Tools for Schools Excellence Awards 2000

National Leaders in Improving Indoor Air Quality in Schools

http://www.epa.gov/iaq/schools/tfsawards2000.html

William Blackstone Elementary School
Boston, Massachusetts
EPA Region 1
Beset for years with numerous indoor air quality complaints, culturally diverse Blackstone was one of three Boston schools selected as pilot partners in EPA's *Indoor Air Quality Tools for Schools (IAQ TfS)*. Principal Mildred Ruiz-Allen led a team that seized upon *IAQ TfS* to make dramatic improvements in school facilities. The school is now assisting other Boston schools in implementing the IAQ program.
For more information, contact: **Eugene Benoit,** US EPA Region 1, (617) 918-1639, benoit.eugene@epa.gov

Baldwin Union Free School District
Baldwin, New York
EPA Region 2
Baldwin Union school officials were among the first to implement *IAQ Tools for Schools*. The school district used the *IAQ TfS* Kit to identify and aggressively employ a broad range of measures to stem sources of possible air quality problems -- from adopting low-odor, low-VOC paints to making exclusive use of HEPA vacuums. According to the *Baldwin Herald* newspaper, "Baldwin children are breathing clean air in their classrooms ... giving the school district the state's green stamp of approval."
For more information, contact: **Michael Sheehan**, (516) 377-9312

Robert K. Shafer Middle School, Bensalem Township School District
Bensalem, Pennsylvania
EPA Region 3
Bensalem School District implemented *IAQ Tools for Schools* in response to citizen concern over poor IAQ in schools. Six schools were pilot *TfS* partners, and all have identified and mitigated a long list of IAQ problems -- ranging from bird nests in HVAC systems to chlorine infiltration in classroom air.
For more information, contact: **Tom Vasek,** (215) 244-4670

Okaloosa County School District
Fort Walton Beach, Florida
EPA Region 4
With 38,000 students in 38 schools, Okaloosa County used to receive hundreds of IAQ complaints each year. Led by Dr. William (Bill) Smith, district Director of Facilities, the school district aggressively implemented *IAQ Tools for Schools* and has seen a dramatic drop-off in IAQ problems. Its success led the school board to adopt *IAQ TfS* as policy, making it mandatory for all facilities.
For more information, contact: **William "Bill" E. Smith, EdD,** (850) 833-3143.

New Ulm Public Schools
New Ulm, Minnesota,
EPA Region 5
New Ulm Public Schools, a rural school district of modest means, embraced *IAQ Tools for Schools* after realizing in 1996 that carpeting upgrades adversely affected air quality and student health. The school system established a district-wide air quality program that has involved staff, students, and unions. The program, which made good air quality in the learning and teaching environment a policy priority, is regarded as a national model for rural school districts with limited means.
For more information, contact: **Scott Hogen**, (507) 359-8440

El Paso Independent School District
El Paso, Texas,
EPA Region 6
El Paso Independent School District responded to mounting indoor air quality concerns during the 1998/99 school year by implementing *IAQ Tools for Schools*, using the program to establish a district-wide (72 of 84 school campuses) air quality survey, response, and problem prevention program. The district reports that *IAQ TfS* enabled a highly organized, logical response to indoor air quality issues that fostered teamwork and a sense of mission district-wide, resulting in a higher quality learning environment.
For more information, contact: **Hector Martinez, P.E.**, (915) 834-5210

Indianola Community School District
Indianola, Iowa,
EPA Region 7
Indianola Community School District became aware of *IAQ Tools for Schools* through an Iowa Department of Education *IAQ TfS* workshop. During walkthroughs, staff found numerous, significant air quality problems. *IAQ TfS* enabled the district to develop a management plan and build team support with teachers and other staff. Initial air quality improvements in a pilot program at an elementary school have led to implementation of the program district wide.
For more information, contact: **Darcy Moeller or Jim Garrett**, (515) 961-9500
moellerd@indianola.k12.ia.us

King-Murphy Elementary, Clear Creek School District
Evergreen, Colorado, EPA Region 8
District school administrators in 1998 learned of *IAQ Tools for Schools* through a teacher who was concerned about air quality problems at school. The *IAQ TfS* Kit enabled, with the assistance of EPA Region 8, a team-building, management, and implementation pilot program at King-Murphy that led to significant and rapid indoor air improvements. Plans are to expand the program to other schools in the district.
For more information, contact: **Art Benton**, (303) 567-2980

Saugus Union School District
Saugus, California,
EPA Region 9
IAQ Tools for Schools was the key to ending an air quality crisis at Saugus Union School District, where blood tests for one student revealed exposure to arsenic, formaldehyde, phenol, and mold toxins suspected of originating in a portable classroom. *IAQ TfS* enabled the school district to implement a comprehensive program that brought the public into the process, remediated air quality problems, and built public trust for the school system.
For more information, contact: **Adina Neale**, (661) 297-8880
aneale@saugus.k12.ca.us

Sedro-Woolley School District
Sedro-Woolley, Washington,
EPA Region 10
High levels of CO_2 became the focus of indoor air improvements after an *IAQ Tools for Schools* walkthrough revealed problems in an elementary school, particularly in the portable classrooms. The district approved special funds to address its IAQ issues. Upgrades and behavioral changes were implemented, and significant improvements in air quality have already been achieved. A close relationship with the Northwest Air Pollution Authority (NWAPA) has helped the district continue to strive for good IAQ and healthy classrooms.
For more information, contact: **Mike Riddle**, (360) 855-3505

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CASE STUDY

WILLIAM BLACKSTONE ELEMENTARY SCHOOL

Boston Public Schools, Massachusetts

William Blackstone Elementary School, located in Boston's South End, is part of the Boston Public Schools system. Of the 120 schools in the system, three were chosen to implement EPA's *Indoor Air Quality Tools for Schools (IAQ TfS)* Kit and program. Of these three schools, Blackstone Elementary was the first to do so.

Approach—Project Description

School Description

The five-story school building was constructed in 1975 using the typical design of that time—brick walls, mostly flat roofs, plexiglass windows, and visible duct work. For years, indoor air quality (IAQ) was an issue at Blackstone Elementary. The school nurse noticed that the asthma rate was higher than the national average of two cases per classroom. Staff were also aware of serious problems with water intrusion during heavy rains, stained and collapsed ceiling tiles, peeling paint and stains on the walls, rust on support beams, and water damage to equipment and furniture.

IAQ Team

In January 1999, the IAQ Team at Blackstone Elementary was the most prepared to meet regularly to implement the program. The school's IAQ team met six times from January to June 1999, using the *IAQ TfS* Kit as the basis of their discussions. The Blackstone team consisted of school district officials, the school principal, the school nurse, teachers, parents, custodians, and EPA regional staff.

The IAQ team and a ventilation engineer from the Boston Public Schools system conducted a walkthrough inspection of practically every area of the school. School staff were given the appropriate documents from the Kit, including checklists covering all areas of the building. About 80 percent of the checklists were returned.

Problem Identification

Problems identified by the checklists and walkthrough included the following:

- An above-average number of asthma cases and illnesses typically associated with indoor air quality problems (headaches, nausea, etc.).
- Water damage, such as mold and mildew; missing, stained, and broken ceiling tiles; fungal growth on ceiling tiles; and damaged ceiling and wall plaster.
- Thermal discomfort, such as widely fluctuating temperatures, too high or too low humidity levels, and cold drafts.
- Ventilation problems, such as poor air circulation and lack of exhaust fans in some bathrooms.
- Cleanliness problems, such as dust accumulation around the supply vents and surrounding ceiling tiles, infrequent dusting and vacuuming, and pest problems.

"Every school has a Healthy Schools Team dedicated to making their school safer and healthier. We received some great press from implementing the Kit—the local newspapers wrote several articles about our Healthy Schools Team."

-Robin Chappell District Health Official

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WILLIAM BLACKSTONE ELEMENTARY SCHOOL

Boston Public Schools, Massachusetts

EPA's IAQ TfS Kit gave the team the leverage it needed to persuade the school district to improve the environmental problems in the school.

Lessons Learned

Short-term Improvements

Based on the information found in the walkthrough, the IAQ team brainstormed and identified specific solutions for improving the indoor air quality at Blackstone Elementary School. In addition, EPA's *IAQ TfS* Kit gave the team the leverage it needed to persuade the school district to improve the environmental problems in the school. Once the Superintendent was informed of the school's IAQ issues and the team's recommendations, Blackstone Elementary was placed on a high-priority list for roof repairs and other renovations.

A number of improvement projects have been completed, including roof repairs during the summer of 1999. Current plans call for installing new energy-efficient lighting and new ceiling tiles. Additionally, carpeting will be removed and replaced with tiles in some classrooms. The school nurse intends to document student health and asthma cases over the next year to establish a link between the indoor environment and children's health.

Long-term Practices and Policies

Blackstone Elementary is now in its second year of *IAQ TfS* implementation and hopes to collect information on the improved health of students and staff. Much of the credit for the school's progress rests with the principal, Ms. Ruiz-Allen, who took over the project after the first meeting and welcomed all ideas. She was instrumental in getting the Superintendent involved and ensuring that the repairs were done quickly. The presence of officials from EPA Region 1, the Boston Public Health Commission, and Boston Public Schools at the meetings also proved key in Blackstone's success, as these groups created a strong sense of purpose and assured the team that their IAQ problems were not impossible to fix.

For more information, contact
Eugene Benoit
U.S. EPA Region 1
Phone: (617) 918-1639

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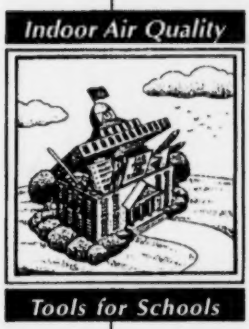
CASE STUDY

ROBERT K. SHAFER MIDDLE SCHOOL

Bensalem Township School District, Bensalem, Pennsylvania



Decision makers in the Bensalem School District wanted to evaluate the strengths and weaknesses of the *Indoor Air Quality Tools for Schools (IAQ TfS)* Kit for different school types: an older school (Belmont Hills Elementary School), a recently renovated school (Robert K. Shafer Middle School), and a new school (Cornwells Elementary School). This case study focuses on Shafer Middle School.

Shafer has had a long history of indoor air quality (IAQ) complaints by staff. Reports of ventilation problems and odors led to suspected adverse health problems for some and eventually resulted in legal action. The teachers contacted the National Institute of Occupational Safety and Health (NIOSH) to evaluate and investigate these suspected problems. NIOSH, part of the Centers for Disease Control and Prevention (CDC), is responsible for conducting research and making recommendations for the prevention of work-related disease and injury. Although the District took immediate corrective action on the items identified by NIOSH, IAQ complaints were still an ongoing issue at Shafer Middle School. Hoping to find answers to their IAQ problems, Bensalem Township School District elected to join an *Indoor Air Quality Tools for Schools* pilot program with the help of EPA Region 3 in September 1998.

"The IAQ TfS Program opened our eyes to the many valuable resources that were available to us."

-Tom Vasek, District IAQ Coordinator

Approach—Project Description

School Description

Shafer Middle School was built in the late 1970's during a time of high inflation and energy prices, so energy efficiency was a prominent consideration in its design and construction. The school was built on a 32-acre site in close proximity to two other schools. The architecture features a ceramic brick and flat-roofed exterior, dropped ceilings, and cinder block walls. There is no basement or crawl space in the school. The school measures 126,260 square feet and is serviced by water source heat pumps. Shafer recently underwent a $4.5 million renovation in 1998-1999 that included substantial upgrades to the roof, lighting, and heating, ventilation and air conditioning (HVAC) system. Approximately 560 students are taught in 40 classrooms.

IAQ Team

EPA Region 3 trained Tom Vasek, Bensalem's IAQ Coordinator and staff member in charge of school environmental affairs, and other district staff on the *IAQ TfS* Program. Shafer's IAQ Team consisted of Mr. Vasek, EPA regional staff, school district officials, the school principal, several teachers, the school nurse, and school support staff. Two of the contractors that were servicing the school, the HVAC contractor and the pest control contractor, also joined the team and made their representatives available to answer questions from team members and teachers. Parents are expected to join the team in the future.

Problem Identification

The IAQ Team conducted two walkthroughs of the school and performed a comprehensive survey of the building structure and equipment. The initial walkthroughs identified numerous IAQ problems, some of which were repaired on the spot while others involved additional cost and complexity. The latter issues were addressed with special School Board approval. Following the second walkthrough, EPA tested humidity, noise, and radon levels in the school.

Teachers completed the *IAQ TfS* Kit checklists in October and November of 1998. These surveys revealed that nearly half of the school's rooms required follow-up action to alleviate the following issues:

- Health complaints, including severe respiratory infections; respiratory irritations (sneezing, coughs, throat irritation, and sinusitis); irritation of the eyes and skin; and headaches.

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ROBERT K. SHAFER MIDDLE SCHOOL

Bensalem Township School District, Bensalem, Pennsylvania

"The IAQ TfS Program fostered communication not only between teachers and custodians but with the contractors as well. The Program allowed us to become part of the school."

-Barry Barnes, Service Technician and IAQ Team member

- Thermal discomfort (some parts of the school were too warm while others were too cold), including fluctuating temperatures.
- Ventilation problems, including infiltration of fumes from a bus platform, poor air circulation, and inoperative or missing exhaust fans in science rooms, computer rooms, and a pool chemical storage area.
- Cleanliness problems, including insects, dirty floors, and dusty furniture.

Bensalem closely adhered to the steps and recommendations of the Kit while conducting its IAQ effort. Teachers completed the checklists four times each year and the IAQ Team mapped the results by floor and room number to track conditions in each room. Use of the Kit also fostered increased communication between staff, IAQ Team members, and the two contractors working closely with the school.

Lessons Learned

Short-Term Solutions

The *IAQ TfS* Program led to wholesale improvements in indoor air quality at Shafer School. Many of the IAQ complaints noted early in the process were readily addressed. For example, fresh air intake has been improved and currently meets or exceeds standards. The *IAQ TfS* Kit also assisted the Team in identifying and amending problems with chlorine odors in the pool vicinity.

Today, the IAQ Team has implemented the nineteen steps of the Kit's Indoor Air Quality Management Plan. Initially, the Team closely followed the IAQ Coordinator's Guide, but they later adapted the work to their specific needs and concerns. The IAQ Team also designed an emergency plan to address situations such as a chemical spill or HVAC shutdown.

Among the many dramatic changes, according to officials, was the before and after difference that the *IAQ TfS* Program made in the management of the school environment. Before enrolling in the pilot program, staff meetings were often marked by unresolved frustration over classroom environmental problems. Once the program was in place, the staff was able to effectively and efficiently develop solutions to IAQ issues. The *IAQ TfS* Kit also played a defining role in helping the teachers learn more about IAQ issues and the effect they have on their health and their students' health.

Long-Term Practices and Policies

The school is currently measuring the success of their IAQ effort using the school nurse's database and surveys of the perceptions of staff and students. The IAQ Team plans to take the results to the School Board so that IAQ efforts in the remaining schools in the District can begin poste haste. Since the pilot program began in 1998, the District implemented the *IAQ TfS* Program in two schools in 1999 and in another school in 2000.

According to school officials, the IAQ Coordinator was the lynchpin for the entire effort. Mr. Vasek's dedication and successful history with the District were essential in gaining buy-in and respect from the School Board. The entire IAQ Team worked together to improve the quality of the learning environment throughout the school. The Team noted that the *IAQ TfS* Program allowed them to identify the resources that were available to them and how to effectively use these resources to combat IAQ problems throughout the district. Bensalem School Township District was among the first schools to be awarded the National *Indoor Air Quality Tools for Schools* Excellence Award in 2000. The IAQ Team has also publicized its successes with a public event that included a speeches by the mayor, state and Congressional representatives, and award presentations.

For more information, contact

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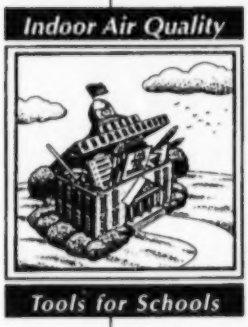
CASE STUDY

OKALOOSA COUNTY SCHOOL DISTRICT

Fort Walton Beach, Florida



In 1992, Okaloosa County School District officials began receiving complaints about dizziness, shortness of breath, and headaches from students and staff at a rural school in the northern part of the county. Public concerns were raised when the media became involved in the situation. Over the next several years, stories were written and broadcast about the indoor air quality (IAQ) health hazards associated with this school, including a segment on *60 Minutes* and negative press coverage from several Florida news stations.

These events led School Board members to realize that the District needed a proactive, organized process for evaluating and managing IAQ in schools district-wide.

Approach—Project Description

School District Description

Okaloosa County School District (OCSD), located in Fort Walton Beach on Florida's panhandle, has 39 schools with 31,000 students ranging from pre-kindergarten to vocational adult education. More than 1,900 teachers serve these students.

"I first ordered the IAQ TfS Kit because it gave me a legal position to stand on. With the impending lawsuits from other schools in our county, I knew the TfS Kit would help provide me with options."

-Dr. Bill Smith Program Director of Facilities, Okaloosa County School District

IAQ Committee

Dr. Bill Smith, Program Director of Facilities, served as the District's IAQ Coordinator. The well-rounded IAQ Team included two principals, a maintenance associate, a bus driver, a member of the District's safety department, and representatives from the Occupational Safety and Health Administration (OSHA), the Florida Health Department, and each gas and electric utility serving the District. Meeting quarterly, they sought to:

- Oversee the district's IAQ program; and
- Develop a forum for school occupants to alert the Team of IAQ problems.

In addition, the district hired two private consultants—one mechanical engineer and one industrial hygienist—to assist in identifying problem areas. Although not officially members of the IAQ committee, the private consultants were employed by Okaloosa to work very closely with the committee through annual contracts of up to three years. When issues and concerns arose through the IAQ committee, the industrial hygienist and mechanical engineer were consulted before a solution was implemented. The committee developed an IAQ plan in 1995.

In 1996, the Okaloosa County School Board reviewed and adopted EPA's *IAQ Tools for Schools (IAQ TfS)* Program district wide, based on the recommendation of the district's IAQ committee. Although many of the strategies outlined in the *IAQ TfS* Kit were already in place, its adoption provided additional education and served as the missing piece the district needed to complete its IAQ program for their schools, bringing credibility and structure to an efficient IAQ program. The committee found and used valuable information in the Kit's checklists, IAQ Coordinator Guide, and sample letters.

Problem Identification

The first signs of IAQ problems were the health issues and media crisis at one rural school. Concerned that the occupants' symptoms (dizziness, shortness of breath and headaches) were caused by the installation of a new roof coating on the school, district officials adjusted the spraying schedule so that the roof coating was not applied during school operating hours.

The IAQ committee initiated a process to perform walkthrough evaluations of each school. Information gathered from these walkthroughs became the basis for prioritizing schools for IAQ upgrades.

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OKALOOSA COUNTY SCHOOL DISTRICT

Fort Walton Beach, Florida

"The IAQ TfS Kit outlines an organized regimented program that also provides credibility."

-Dr. Bill Smith Program Director of Facilities, Okaloosa County School District

A major problem that was found consistently in all of the schools in the district was humidity control. Old and poorly maintained equipment made controlling the already high Florida humidity much more challenging. Because of the treatment of outside air to combat humidity, schools in Florida find it more difficult to adhere to national standards for fresh air intake than do schools in states with lower humidity.

Each year since the mid-1990s, OCSD had been replacing faulty or old equipment with new equipment in an attempt to meet American Society for Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards for fresh air, but was failing to meet these standards. Nationally recognized as the minimum, ASHRAE standards for fresh air intake are the same for all schools nationwide. From 1995 to 1997, the facilities office developed design criteria for HVAC systems to improve the indoor air of the district's new schools and to provide guidelines as systems were replaced. Short-term solutions for OCSD included the use of portable dehumidifiers.

Using the checklists found in the *IAQ TfS* Kit as guidelines, the IAQ committee developed a customized IAQ form to be completed by school occupants, which has proven very useful in alerting the Facilities and Maintenance (F&M) department to IAQ problems. Teachers and staff members complete short forms and submit them to the principal for signature, who then passes them on to the F&M department. After discussing the problem with the individual who initially completed the form, Dr. Smith evaluates the problem area and notes proposed actions on the request form. The district F&M department is responsible for fixing the problem. In all cases where a complaint is raised through an IAQ form, the IAQ Team follows up with an interview and a site visit after which proposed actions are developed.

Through the use of these IAQ forms, district-wide occurrences of allergy irritation, unpleasant odors, and mold and mildew growth have been uncovered. In one instance, a teacher filled out an IAQ form alerting the district of odors and mildew in her classroom, and noted that the air was frequently off in the summer and occasionally during the week when class was in session. As it happened, a new chiller was scheduled for this school to resolve airflow problems. After an interview and site visit, the room was throughly cleaned and, when the new chiller was installed, the problems were resolved.

Parents are also welcome to submit IAQ forms. One parent submitted a request form regarding her second-grade child who had been sick for quite some time. This child was taking five different medications for allergy and asthma problems. The parent specifically addressed the issue of mold in her child's classroom. Within a few weeks, interviews with the parent and the child's doctor were conducted, as well as a site visit to the classroom. The classroom was throughly cleaned.

Lessons Learned

Short-Term Solutions

Once the decision was made to pursue healthy IAQ by creating an IAQ committee and a proactive plan, all 39 schools were prompted to begin implementing the *IAQ TfS* Kit. Dr. Smith ordered Kits for each school's site administrator, usually the school principal. To follow up, Dr. Smith met personally with each site administrator to discuss implementation of the Kit and specific IAQ issues that were discovered and being addressed at that particular school.

District officials found that, for their situation, having a district IAQ committee with support from each site administrator proved to be the most efficient method for IAQ implementation. IAQ forms are taken very seriously, and all complaints are considered real. Having an official IAQ form and personal interview with the individual who completed the form allows for efficient follow-up.

To help control IAQ, the district established design and renovation criteria to make sure IAQ measures were implemented consistently in all schools. Following are examples of these criteria:

- Using 2x2 foot ceiling tiles instead of 2x4. The larger ceiling tiles tend to sag, creating areas for mold and mildew penetration and accumulation.
- Using tiling in all hallways, high-traffic areas, and densely populated schools, rooms, or classrooms in place of carpet. Carpet is too hard to keep clean in these areas.

OKALOOSA COUNTY SCHOOL DISTRICT

Fort Walton Beach, Florida

District officials found that, for their situation, having a district IAQ committee with support from each site administrator proved to be the most efficient method for IAQ implementation.

- Using vinyl composition tile (VCT) instead of regular vinyl. VCT provides a tighter seal and allows the replacement of individual tiles.

Smaller IAQ issues are handled on a case-by-case basis.

The number of complaints (related to both health and faulty equipment) in the district's schools has dropped dramatically from 75 in 1994 to fewer than fifteen in 1999.

Long-Term Practices and Policies

To ensure good IAQ, district-wide evaluations are conducted annually by service engineers, plumbers, and electricians who are assigned to assess each school. Their evaluations identify preventive measures, IAQ problems, and solutions. Their evaluations also serve as a means to specify the budgets for necessary improvements in each school.

Over the last six years, OCSD has made significant strides to ensure a healthy learning and working environment for students and staff. A formal process is in place to identify, prevent, and resolve IAQ problems district-wide, and investments have been made to fund major school renovations, including replacement and repair of HVAC components such as boilers and chillers. The Okaloosa County School Board and Superintendent agree that their IAQ program has proven beneficial and that the *IAQ TfS* Kit continues to be an invaluable tool for educating and ensuring a healthy environment for students and staff.

OCSD was among the first school districts to receive the National *Indoor Air Quality Tools for Schools* Excellence Award in 2000.

For more information, contact:

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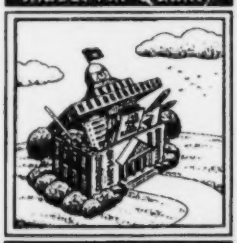
CASE STUDY

KING-MURPHY ELEMENTARY SCHOOL

Clear Creek School District, Colorado

Indoor Air Quality



Tools for Schools

King-Murphy Elementary School, part of the Clear Creek School District, is located in Evergreen, Colorado, about 30 miles west of Denver. Two hundred and fifty students in grades K through 6 attend the school.

Approach—Project Description

School Description

The two-story King-Murphy Elementary School was built in 1982, using a passive solar design. The heating, ventilating, and cooling (HVAC) system consists of unit ventilators and five new rooftop units for heating and cooling the second-floor classrooms.

Prior to the indoor air quality (IAQ) campaign at King-Murphy, the school district hired a new Facilities and Maintenance Director. He negotiated a performance contract with an energy service provider, who would design a plan, install energy-efficiency technologies, and guarantee their performance. The contract covered upgrading the school's HVAC system and installing a district-wide energy management system (EMS). District staff knew that IAQ problems existed in some of their schools and were committed to considering the effects of energy efficiency upgrades on IAQ as the upgrades were planned and implemented.

"The IAQ TfS Kit prompted us to track our student health problems, like asthma and allergies, and try to relate them to our past IAQ improvements. We've really been noticing the number of student absences decreasing since the IAQ improvements were initiated."

-Art Benton
Facilities and Maintenance Supervisor

IAQ Team

The school formed an *IAQ Tools for Schools (TfS)* steering committee in October 1998, led by the principal and the custodian. The team also included the District Facility Maintenance Supervisor, a teacher, a student from the Environmental Science Club, and a parent. They developed a 5-month plan for implementing *IAQ TfS*.

Problem Identification

The first IAQ meetings revealed very real concerns, including hazardous waste removal and management, exhaust fumes in the building, irregular filter replacement schedules, general inadequacy of the air-handling system, and overheating from the south-facing clerestory windows. The potential for radon gas was also a concern because the school is located near mountains containing old coal mines. Seepage of the radon gas from these mines was an issue not to be overlooked. All concerns were ultimately addressed by implementing *IAQ TfS*.

The teachers completed their IAQ checklists in December, and the head custodian and principal coordinated completion of the remaining lists. Then the team reviewed the checklists and prepared for a walkthrough. The walkthrough consisted of one-on-one interviews with teachers who had identified specific concerns, and visual inspection of certain areas of the school with identified or potential problems. Staff measured and recorded carbon dioxide (CO_2) levels and room temperatures, along with any observations and interview information, on a spreadsheet.

The walkthrough revealed that diesel fumes from idling buses entered several rooms on the south side of the building through the unit ventilators. The team also noted that the outside air dampers were set to allow air in only when the temperature is above 40° F to prevent freezing coils, thus leaving classrooms without adequate outside air during most of the heating season. Radon testing showed low radon levels (below EPA's action level) throughout the school.

Although many IAQ issues were identified, the team was aware of concerns about the impact of the new program on the maintenance staff's workload, as they were already very busy. The Facilities Director addressed these concerns and also assured the maintenance staff that the IAQ issues and operational changes identified were not a critique of their performance. The IAQ work at the elementary school commenced soon after.

(over)

KING-MURPHY ELEMENTARY SCHOOL

Clear Creek School District, Colorado

"I got a lot more out of IAQ Tools for Schools than I anticipated. The program has really helped us because we are addressing things that needed to be fixed and we can take this to other schools [in our district]."

–Art Benton
Facilities and Maintenance Supervisor

Lessons Learned

Short-term Solutions

As a result of the walkthrough in January 1999, the team developed a set of IAQ policies for King-Murphy Elementary School. Staff are advised to do the following:

- Keep unit ventilators clear of books, papers, and other items.
- Maintain the temperature between 68° and 72° F.
- Keep warm-blooded pets out of classrooms or, when they visit, limit time of exposure and ensure good ventilation.
- Be aware of the cleaning schedule and expectations for keeping horizontal surfaces clean.

Staff are also encouraged to know the proper procedures for storing and discarding chemicals. Material Safety Data Sheets on the chemicals will be kept on file and updated whenever necessary. The district sought a waiver from Health and Human Services to use a bleach alternative for weekly cleaning, and that has become the rule. The policies were communicated to all staff and included in the new-teacher and beginning-of-year information packets.

The school also worked with its energy service provider to address IAQ problems related to the HVAC system. The contractor adjusted the outside air dampers and added glycol to the water pipes to increase the amount of outside air during the heating season. Timers were installed to shut off the outside air supply during the 15-20 minutes the buses are loading. This will prevent diesel fumes from entering classrooms on the south side of the building through the unit ventilators. The school arranged to install tinted clerestory windows to reduce overheating in upstairs classrooms. Plans were also made to replace metal air filters with pleated paper filters, which are up to 80-percent efficient. The school's preventive maintenance plan specifies that the filters are to be replaced every 90 days.

The IAQ team members noticed a dramatic improvement in their comfort levels and a decrease in IAQ-related complaints between the first and last scheduled IAQ meetings.

Long-term Practices and Policies

Implementing the *IAQ TfS* Kit was a positive learning experience for the Clear Creek School District. Participants agreed that the onsite involvement of knowledgeable staff from EPA's regional office was key to the successful implementation of the Kit at King-Murphy Elementary School. As a direct result of implementing the *TfS* Kit, the district is now establishing hazardous waste training sessions for all staff members. One year ago such programs were not considered necessary, but the success of the *IAQ TfS* Kit helped pave the way for new environmental issues to be addressed.

District staff are making *TfS* a learning experience for students, too. From the very beginning, the Superintendent requested that the students be included as much as possible. King-Murphy students helped complete checklists, collected particulate samples, and wrote about what they learned. IAQ provided an opportunity for students to get involved in their own education and increase their awareness of the indoor environment.

In a new program beginning September 2000, Art Benton, Facilities and Maintenance Supervisor, is establishing an internship for high school students from the district. They will review the recorded sick days of students and staff from all district schools that implemented the *IAQ TfS* Kit and record the reason for the sick day—whether it can be attributed to asthma, allergies, flu, or simply missing the bus. Also in September, Georgetown Elementary School will begin to participate in the *IAQ TfS* program.

For more information, contact
Art Benton, Facilities and Maintenance Supervisor
Clear Creek School District
Phone: (303) 567-2980

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Headquarters Press Release

Washington, DC
For Release 08/09/2001

SCHOOLS AWARDED FOR HEALTHY INDOOR AIR

Also Available in Spanish: "Escuelas Premiadas Por Buena Calidad de Aire Dentro de Espacios Cerrados"

Environmental News

FOR RELEASE: THURSDAY, AUGUST 9, 2001

SCHOOLS AWARDED FOR HEALTHY INDOOR AIR

Cathy Milbourn 202-564-7824 / milbourn.cathy@epa.gov

For the second year, awards will be given to 19 schools around the country for adopting programs to improve indoor air quality in their buildings. These awards will be presented at EPA's 2nd Annual Tools for Schools National Symposium. This symposium brings school officials, nurses, teachers, facility managers, parents and others together to raise awareness about indoor air quality and the potential negative effect poor indoor air quality can have on our children's health.

"Good indoor air quality contributes to a favorable learning environment. The Tools for Schools program is a common-sense guide to help prevent and solve the majority of indoor air problems affecting many of our nation's schools", said Administrator Christie Whitman. "We hope more schools across the country will be encouraged to participate in this valuable program."

Children spend an average of eight hours a day in school. Pollutants inside classrooms and other indoor school facilities are often 2-5 times higher than outdoor levels and can trigger asthma attacks. Asthma in young children has risen by nearly sixty percent in the last fifteen years and is responsible for 10 million missed school days per year.

The schools receiving these awards used EPA's Indoor Air Quality Tools for Schools kit to improve air quality. EPA's Indoor Air Quality Tools for Schools program is a nationwide initiative to help school officials address indoor air quality problems and reduce exposure to asthma triggers in the classroom and other school facilities. This kit shows schools how to improve indoor air problems at little cost by using simple activities and existing school staff. For more information about this program visit: **www.epa.gov/iaq/schools/** on EPA's web site or call 1-800-438-4318 and ask for the Tools for Schools Road Map.

More than 360 health professionals and environmental experts from around the country will attend this award ceremony on Thursday, August 9 from 6p.m.to 8 p.m. at the Grand Hyatt Hotel, Washington, D.C. At this event, EPA will honor thirteen schools and school districts with the prestigious annual Excellence Awards and six schools with Special Achievement Awards for creating a healthier environment for students and staff.

The award winners are: Nashua School District, SAU#42, Nashua, N.H.; North Country Union High School, Newport, Vt.; Connecticut School Indoor Environment Resource Team, Hartford, Conn.; Chicopee Public Schools, Chicopee, Mass.; Little Harbour School, Portsmouth School District, Portsmouth, N.H.; West Windsor-Plainsboro Regional School District, Plainsboro, N.J.; Montgomery County Public Schools, Rockville, Md.; West Virginia Department of Education, Charleston, W.Va.; Savannah-Chatham County Public Schools, Savannah, Ga.; Hillsborough County Public Schools, Tampa, Fla.; St. Cloud Area School District 742, St. Cloud Minn.; Naperville Community Unit School District 203, Naperville, Ill.; Ft. Bend Independent School District, Stafford, Texas; Scott Middle School, Lincoln, Neb.; St. Mary's Central High School, Bismarck, N.D.; Jefferson County R-1 School District, Lakewood, Colo.; Visalia Unified School District, Visalia, Calif.; Educational Service District 101 - Washington State, Spokane, Wash.; Everett School District #2, Everett, Wash.

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IAQ *Tools for Schools* Excellence Awards 2001

National Leaders in Improving Indoor Air Quality in Schools
2001 Award Winners by EPA Region
http://www.epa.gov/iaq/schools/tfsawards2001.html

EPA Region 1 - Excellence Awards

North Country Union High School, Newport VT

Complaints of headaches, nausea, and sinus infections used to be commonplace at North County Union High School. Two employees even filed lawsuits against the Orleans Essex North Supervisory Union, the school district. But the school community has turned around Union High's IAQ problems. In 1997, the school board formed its Ad Hoc IAQ Committee. Using an employee questionnaire, based on materials in the Indoor Air Quality Tools for Schools (IAQ TfS) Kit, the Committee identified trouble spots, e.g., idling delivery trucks that pumped diesel fuel fumes into the building. Most important, the committee recommended a radical upgrade of the entire ventilation system at Union High, to ensure sufficient fresh air in every room. School board members agreed and successfully campaigned for a bond issue and budget that are financing the renovation. North County Union High stands as a model to other schools in the region.
Contact: Mary C. Scarpa, (802) 224-7921.

Nashua School District, Nashua, NH

Nashua School District was among the first to participate in the IAQ TfS Program in New Hampshire. Since the early 1990s, school staff had reported the smell of musty, stale air, which was the result of poor ventilation and leaky roofs. With the help of IAQ TfS, the District introduced yearly inspections of all facilities, set new standards for building maintenance, and gave janitors better equipment and training for using chemicals. Nashua continues to be innovative, by adapting the TfS Kit to the needs of individual schools. Nashua also shares its expertise with other school districts by hosting training sessions and conferences.
Contact: Jeannette Kotopoulis, (603) 594-4330.

Connecticut School Indoor Environment Resource Team, Hartford, CT

Who are you going to call if you're in Connecticut and you want free expert advice on how to implement the IAQ TfS Kit? The Connecticut School Indoor Environment Resource Team

(CSIERT) is the long but correct answer. Founded in 1999 by the Connecticut Department of Public Health, EPA New England, and the Connecticut Council for Occupational Safety and Health, the Team is now a statewide network of IAQ specialists, trainers, and health experts. To date, it has helped 43 schools in 18 school systems implement the IAQ TfS Program. CSIERT has become a one-stop resource for schools that need help with the basics of IAQ to the most sophisticated of issues. It is one of just a few state-based programs in the country.
Contact: Kenny Foscue (860) 509-7742.

Little Harbour School, Portsmouth, NH

Little Harbour School entered the IAQ TfS Program in 1997 after years of complaints from school staff about chronic bronchitis, sinusitis, and even new diagnoses of asthma in three teachers. Student asthma cases had also been rising. Little Harbour IAQ advocates used a team approach to overcome skepticism about whether a program was workable or even necessary. Its IAQ committee included members from across the school community and outside experts. Little Harbour has identified its ventilation problems and set short-term and long-term goals, steadily improving indoor air quality and winning people's confidence. The school nurse's office reports that student visits for headaches and stomach aches are down by at least 15 percent. School staff are reporting far fewer bronchitis cases. The Team's commitment to bring IAQ TfS to every school in Portsmouth demonstrates its continued dedication to IAQ issues.
Contact: Peter Torrey or Priscilla Santiago (603) 436-1708.

Chicopee Public Schools, Chicopee, MA

The Chicopee Public School District joined the IAQ TfS Program in 1996 and is the first district in the nation to equip all of its buildings with an IAQ TfS Kit. The IAQ Team represents a cross-section of the District, including trade union representatives, a teacher, nurse, and parent. It established short-term solutions to IAQ problems and long-term practices, e.g., written procedures for the use of pesticides and chemicals in school, and establishing better communication between teachers and custodial and maintenance personnel. Chicopee continues to tailor the IAQ TfS Kit to each school and shares its experiences with other districts.
Contact: Ronald Simard, (413) 594-3417.

EPA Region 2 - Excellence Award

West Windsor-Plainsboro Regional School District, Princeton Junction, NJ

West Windsor-Plainsboro Regional School District has implemented the IAQ TfS Program in all of its 10 schools since joining the Program in 1997. From the start, the District's IAQ leaders emphasized team work and communication. They involved District officials and teachers in the

process, ensuring that IAQ became an issue for everyone, not just facilities personnel. Starting with one school, the Program has expanded to all 10 school buildings in the District. The IAQ Team has tackled a range of environmental concerns, including pest management and energy efficiency. Assistant IAQ Coordinator Robert Austin, District Director of Buildings and Grounds, now teaches national audiences about IAQ TfS. West Windsor-Plainsboro is emerging as a leader in IAQ management.
Contact: Robert W. Austin, (609) 716-5341.

EPA Region 3 - Excellence Awards

Montgomery County Public School District, Rockville, MD

Montgomery County Public School District recognizes that indoor air pollutants can trigger asthma problems and allergic reactions. The District is working with Montgomery County health officials, parents, employee groups, and the Montgomery County Asthma Improvement Resources Coalition to take the message of IAQ TfS into the school community and beyond. The District is also participating in a study titled Health, Energy and Productivity in Schools, which is run by the HP-Woods Research Institute, of Virginia. An excellent example of team work and community cooperation, the District has achieved much and aims to place an IAQ program in all its schools by the end of FY2004.
Contact: Barry Hemler, (301) 279-3478.

West Virginia Department of Education, Charleston, WV

Education lies at the heart of the IAQ TfS Program, especially in West Virginia where the state's Department of Education has implemented a very proactive indoor air quality program that is highly supported by the WV Bureau of Public Health and the WV Legislative bodies. Staff members have completed indoor air quality facilities reviews, identified problems, provided technical assistance to schools and recommendations for resolution of problems. Outreach and education to the public, school personnel and local county officials has been accomplished through the presentation of training programs and cooperative efforts with the Department of Health. WV is now dealing with the aftermath of extreme flooding that has lead to severe damage, including mold, in several county school districts. The WV Department of Education IAQ TfS Program will be instrumental in assisting school personnel to correct and rebuild these schools.
Contact: Bill Elswick, (304) 558-2969.

EPA Region 4 - Excellence Awards

Savannah-Chatham County Public School District, Savannah, GA

School nurses work on the front lines of the Savannah-Chatham County Public School District's IAQ efforts. In August 2000, the District and the Chatham County Board of Health's Environmental Health Division provided the IAQ TfS Kit and training to nurses at all 54 schools. The nurses began implementing the Program through their asthma management plan, sharing information with parents as well as school staff. The District's Risk Manager also provided IAQ training to maintenance and custodial staff. Thanks to these efforts, most principals understand their Heating, Ventilation, and Air Conditioning (HVAC) systems better than before and teachers can better diagnose IAQ problems, thanks to the Kit's checklists. The District and Health Department are taking the IAQ message beyond the school, cooperating with community groups and government agencies to promote improved IAQ in homes.
Contact: A. Blane Goss, (912) 201-5272.

Hillsborough County Public Schools, Tampa, FL

The IAQ Team at Hillsborough County Public Schools District credits its program, which is based on IAQ TfS, with saving thousands of dollars and creating a greater understanding of IAQ issues among staff. The District trained its Safety Specialists in the identification and resolution of basic IAQ problems. Since the program began in 1998, the District reports that it has only spent $400 of public funds on IAQ consultants, compared to an estimated $250,000 prior to 1997.
Contact: Glen Lathers or W. Gene Taylor, (813) 272-4000.

EPA Region 5 - Excellence Awards

Naperville Public School District, Naperville, IL

Naperville teachers complained of flu-like symptoms and employees blamed sick-building syndrome. Although outside testing did not find elevated levels of indoor pollutants, the Naperville Public School District decided to implement the IAQ TfS Program to help improve resolution of IAQ issues. The District used the Kit as a starting point, adding a teacher survey, developing a flow chart to organize complaint procedures, regularly reporting to the School Board, and other initiatives. The District has steadily gained positive media coverage of its efforts. A strong program, Naperville continues to expand its efforts to ensure a healthy school environment.
Contact: Laurie Bachar, (630) 983-2233.

St. Cloud Area School District #742, St. Cloud, MN

When diagnoses of asthma and allergies went up and absenteeism climbed at St. Cloud Area School District 742, school officials began suspecting a link between these trends and teachers' complaints about stuffy classrooms. The District turned to the IAQ TfS Kit for help. First, volunteers assembled an IAQ management plan. From there, six building engineers conducted walkthroughs of every school in the District, and its three administration buildings. It soon became clear that some schools were infested with mold, a trigger for asthma. Thousands of dollars went into the repair of water-damaged areas, a result of heavy rainstorms. The IAQ TfS Kit has been implemented in all 18 schools. In addition, the District has adopted an integrated pest management program. School and District staff report that the schools are cleaner and healthier. St. Cloud's program goes from strength to strength.
Contact: Michael L. Forer, (320) 253-9370 ext. 1405.

EPA Region 6 - Excellence Award

Fort Bend Public School District, Stafford, TX

Fort Bend Public School District has worked hard to overcome problems with communication and bring representatives from across the school community into the IAQ TfS Program. For example, each school sent an IAQ fact sheet in English and Spanish to parents. IAQ information pamphlets are available at front offices and clinics, while teachers can complete their checklists on line. On the management side, two District IAQ coordinators manage IAQ TfS efforts in each school. Fort Bend has overcome hurdles of communication and organization to build an effective IAQ program. Today, Fort Bend assists other districts with communications.
Contact: Bill Steber, (281) 634-5555.

EPA Region 7 - Excellence Award

Scott Middle School, Lincoln, NE

Scott Middle School implements the IAQ TfS Kit in a creative way. The school formed not one but five IAQ management teams of teachers. Teachers use checklists to identify IAQ problems and take their findings back to their teams. This process happens twice a year and has led to improvements. For example, the school has documented high levels of formaldehyde, an issue that has been resolved by bringing in more fresh air. School personnel detected outside air pollutants wafting into the building from an illegal construction site trash fire, a problem which was easily fixed. Scott Middle School is seeing good results from this work. Before implementation of IAQ TfS, several children were diagnosed with symptoms of early respiratory complaints. The school's health office has reported no such problems have occurred since the introduction of the Program.

Contact: Annie Scott, (402) 436-1218.

EPA Region 8 - Excellence Awards

St. Mary's Central High School, Bismarck, ND
In October 2000, St. Mary's Central High School began using the IAQ TfS Kit to identify IAQ concerns and set priorities. Using checklists, IAQ volunteers discovered the foundation surrounding the music room had settled and cracked, letting water seep through. The school will use its own funds plus donations to fix the problem and replace the carpet. The school carried out numerous repairs and upgrades to the kitchen and dining areas based on evidence collected through the checklists. St. Mary's has made good progress in a short time and is passing on its experiences to other schools.
Contact: Brad Burchinal, (701) 223-4113.

Jefferson County R-1 School District, CO

A recent participant in IAQ TFS, Jefferson County R-1 School District has developed a pilot program for IAQ TfS in nine of its schools. The District started with training sessions for facility and maintenance personnel and energy managers. From there, staff concentrated on assessing the state of the schools' ventilation and finding specific problems to tackle. The next step is to compile the data and prioritize repairs, renovations, and other methods for improving ventilation. The Jefferson County program emphasizes the important role that maintenance personnel can play in improving IAQ. Plans are underway to build on this early success and apply the program throughout the District.
Contact: Tom MacDonnell, (303) 982-2413.

EPA Region 9 - Excellence Award

Visalia Unified School District, Visalia, CA
Located in the heart of the San Joaquin Valley, this agricultural community has one of the highest rates of childhood asthma in the United States. As the community grew increasingly aware of the effects poor indoor air quality can have on health, Visalia Unified School District (VUSD) officials turned to the IAQ TfS Program. VUSD has established a District IAQ Management Team and Site Coordinators in all of its 32 schools. These volunteer teams are cataloging long-standing concerns such as the many classrooms that have inadequate outside air ventilation. VUSD is taking significant steps to improve the health of its community in the face of great challenges.
Contact: Susan Cox, (559) 730-7868.

EPA Region 10 - Excellence Awards

Everett School District #2, Everett, WA
The Everett School District #2 (ESD) turned to the IAQ TfS Program after a major IAQ issue. In 1994, the ESD closed a middle school because children complained of watery eyes and nausea when they were in a particular classroom. ESD formed an Indoor Environment Program, which led it to IAQ TfS. Using the Kit, ESD gathered data about asthma and IAQ tests, which it shared with the public and school employees. This was an important step in maintaining the trust of the community. Now every school uses IAQ TfS to identify and resolve IAQ problems. ESD is emerging as an effective and enthusiastic supporter of IAQ TfS.
Contact: Gary Jefferis, (425) 388-4770.

Educational Service District 101, Spokane, WA

Education Service District 101 (ESD 101) has been distributing the IAQ TfS Kits for several years, but many schools had not managed to establish IAQ management plans. In 2000, ESD 101, determined to make its IAQ TfS efforts more effective, opened its doors to experts from the Washington State University Cooperative Extension Energy Office in Spokane, which assesses implementation of IAQ TfS under an EPA grant. The Washington State University team conducted walkthroughs in more than 50 of ESD 101'S 242 schools. The experts discovered small IAQ problems that were easily fixed and more serious concerns that were corrected, thanks to IAQ TfS. Despite a lack of funds in rural communities, ESD 101 is working hard to advance IAQ TfS in its schools and achieving promising results.
Contact: Ann Wawrukiewicz, EPA Region 10, (509) 456-6320 or Jim Kerns, (509) 456-6320.

IAQ *Tools for Schools* 2002 Award Winners

2002 Excellence Awards and 2002 Special Achievement Awards

2002 Excellence Award Winners

City and Borough of Juneau School District, Juneau, AK
Eanes Independent School District, Austin, TX
Hamden Public Schools, Hamden, CT
Huber Heights City Schools, Huber Heights, OH
Independence School District, Independence, MO
Jefferson County Public Schools, Louisville, KY
Mandan Public School District, Mandan, ND
Mesa Public Schools, Mesa, AZ
Norwich Public Schools, Norwich,CT
Plano Independent School District, Plano, TX
Reading School District, Reading, PA
Sharon Public Schools, Sharon, MA
Township of Ocean Board of Education, Oakhurst, NJ
Williamson County School District, Franklin, TN

2002 Special Achievement Awards

Buist Academy for Advanced Studies, Charleston, SC
Delaware Joint Vocational School, Delaware, OH
East Dubuque Community Unit School District #119, East Dubuque, IL
Nassau County Board of Cooperative Educational Services (BOCES), Westbury, NY
Northwest Air Pollution Authority, Mount Vernon, WA
San Francisco Unified School District, IAQ Policy Implementation Committee, San Francisco, CA

City and Borough of Juneau School District, Juneau, AK

The American Lung Association of Alaska helped Juneau School District to implement the IAQ TfS Program by coordinating training sessions and involving local experts on asthma and IAQ issues. The IAQ Team, led by Allergy & Asthma Network Mothers of Asthmatics (AANMA) encountered early resistance from district administrators, but after sharing information on the importance of good IAQ in schools, they earned the support and approval of the district to

continue the IAQ program. The Team developed an IAQ plan which included policies and procedures for maintenance and building management. Juneau School District continues to work cooperatively with ALA of Alaska, AANMA, and EPA Headquarters to keep up-to- date on IAQ issues, receive continued training for district staff, and fund building improvements to reduce asthma rates.
Contact: Cathy Boutin, (907) 463-1899

Eanes Independent School District, Austin, TX

Eanes ISD encountered IAQ problems seven years ago when facilities staff received reports of poor air quality in certain schools. Immediately, district staff relied on the IAQ TfS Kit's problem- solving wheel to detect IAQ problems including poor ventilation, water damage, and foul odors. Staff attended workshops and seminars addressing IAQ issues, which helped guide the formation of the district's IAQ Management Program and Team. The IAQ Team currently shares updates on the district's IAQ improvements via the internal staff newsletter and discusses issues during faculty and parent association meetings. This past spring, Eanes ISD approved a $67 million bond issue to renovate schools and upgrade equipment and maintenance practices for better air quality and ventilation. The district continues to be proactive in addressing concerns and is committed to working with IAQ TfS to improve the condition of school facilities.
Contact: Laura Santos-Farry, (512) 329-3460

Hamden Public Schools, Hamden, CT

After learning of the IAQ TfS Program district nurses introduced the Kit to administrators and other school staff. Using the IAQ TfS Kit as a guide, all Hamden school staff participated in training sessions and building walkthroughs. The chairperson of the Health and Safety committee and the Director of School Health Services acted as the IAQ Coordinators and facilitated training sessions for team members. Since implementing the Kit, Hamden Public Schools has experienced a noticeable decrease in student absenteeism, decreased student visits to the school nurse for asthma and inhaler usage, and a reduction in incidents of headaches and flu-like health symptoms. The district continues to improve communication with the school community on IAQ issues by posting updates on the Web and in newsletters. Hamden Public Schools is an enthusiastic supporter of neighboring schools, who are beginning IAQ management programs. Hamden continues to share their experiences and discuss IAQ issues at educational meetings and the Health and Safe School Environments state conference.
Contact: Mary Levine, (203) 407-2070

Huber Heights City Schools, Huber Heights, OH

After attending seminars on IAQ TfS sponsored by the Ohio Department of Health and the American Lung Association in Spring 2001, the district's maintenance supervisor met with the

Safety Committee to communicate the importance of good IAQ. After the school board approved implementation of the Kit in Spring 2002, the maintenance department organized a kickoff meeting and received positive recognition from local media. The maintenance supervisor organized an IAQ Team at each school and conducted workshops to train staff on the IAQ TfS Program. The IAQ Teams participated in walkthroughs and completed checklists to help maintenance staff identify problems. Several low- cost solutions have already been implemented including: installing ventilator filters to capture more contaminants; using anti-bacterial tablets to inhibit mold and mildew growth in HVAC coils; removing carpet and installing tiles; fixing or replacing exhausts and vent fans; and replacing spray pesticides with baits and traps for better pest management. Huber Heights City Schools has made great strides in working with IAQ TfS in a short period of time, and continues to encourage district-wide commitment to good IAQ practices.
Contact: David Manning, (937) 237-6388

Independence School District, Independence, MO

Independence School District (ISD) began working with the ALA's Open Airways Program to help students manage their asthma and identify asthma triggers in school buildings. Further health problems such as sinus infections, bronchitis, and asthma, reported by staff prompted ISD to explore the IAQ TfS Program. Working with the City of Independence Health Department, the district began implementing IAQ TfS in September 2001. Facilities staff use IAQ TfS checklists during regular building walkthroughs and have implemented a few routine cleaning practices for better maintenance, including changing filters every four months and notifying schools before pest control companies spray pesticides on school grounds. ISD maintains positive community relations, working with Lowe's Home Improvement Warehouse to collect building supply donations for IAQ projects. ISD staff are proactive in addressing complaints and have established a strong partnership with the City of Independence Health Department, earning the district positive recognition throughout the community.
Contact: Dee Hampton, (816) 325-7320 or Alan Kelley, (816) 521-2800

Jefferson County Public Schools, Louisville, KY

Jefferson County Public Schools is an IAQ TfS leader and mentor for other schools in the surrounding community. Developing a proactive approach to managing IAQ district-wide, it took steps to improve knowledge, communications, and teamwork. Using the information provided in the IAQ TfS Kit, the district offers training for team building and problem solving skills focused on effectively managing and preventing IAQ problems. Team members conduct weekly walkthroughs in all schools, implement an integrated pest management program, conduct routine radon testing and mitigation, and regularly monitor airflow. These efforts have led to concrete results student attendance rates and test scores are rising and there are fewer complaints about IAQ issues. The district's other outreach efforts include serving on various organization boards,

participating in school and organization meetings, and encouraging other school districts to adopt good IAQ practices.
Contact: James Vaughn, (502) 485-3289

Mandan Public School District, Mandan, ND

Mandan Public School District first learned of the IAQ TfS Program from the American Lung Association of North Dakota (ALA), who conducted an information session for the district superintendent and several principals on prominent IAQ issues. Team leaders and volunteer staff completed checklists during walkthroughs and prepared an action plan to prioritize building repairs. The district identified three key problem areas: general cleaning practices, ventilation, and thermal comfort which resulted in the suggested implementation of several low cost solutions, including repairing air handling systems, replacing air filters regularly, using HEPA filter vacuum cleaners, cleaning floor drains and dry sink drains weekly, and landscaping grounds to divert water drainage from building foundations. Team leaders developed news releases and provided them to local media to share information on the district's successful IAQ program. Mandan Public School District continues to work with the IAQ TfS Program and uses the IAQ action plan to identify solutions and make repairs.
Contact: Ray Leingang, (701) 683-9531

Mesa Public Schools, Mesa, AZ

Regular complaints of stuffy air, mold, headaches, nausea, fatigue, and increased asthma episodes prompted Mesa Public Schools to develop a comprehensive IAQ Management Program. The district began using the IAQ TfS Program, and designed a prototype modular classroom to test and monitor equipment that increases fresh air intake, maintains carbon dioxide comfort levels, and eliminates IAQ problems in portable classrooms. IAQ Team members used checklists and the problem-solving wheel provided in the Kit to develop a flow chart for addressing IAQ and related health problems. Over the last four years, test scores have noticeably increased. The IAQ Team conducts regular meetings with faculty, parents, and the community to share Mesa's experience with the IAQ TfS Program and has presented information on IAQ and mold at national workshops. Mesa Public Schools has received positive local and national recognition for its IAQ program and is committed to establishing a healthy learning environment in district schools.
Contact: David Peterson, (480) 472-6000

Norwich Public Schools, Norwich, CT

Norwich Public Schools conducts monthly IAQ

Team meetings to discuss IAQ issues and offers training on the IAQ TfS checklists and guides to teachers, staff, custodians, and maintenance personnel. The Director of Facilities works with local Health, Fire Department, Police Department, Department of Public Works, Yale University, and the University of Connecticut, to implement and enhance the school's IAQ management plan. Faculty members have expressed great appreciation for noticeable improvements to their classroom environment, particularly increased airflow and cleanliness. Norwich Public Schools serves as an example to other schools in the region by sharing its IAQ TfS successes at state and local education association meetings.
Contact: Michael Frechette, (860) 823-4245

Plano Independent School District, Plano, TX

After the facility department spent $60,000 to eliminate mold contamination from a rented facility used for an early childhood center, district administrators realized the importance of a proactive approach to IAQ issues. The IAQ TfS Program, supported from top-level management from the very beginning, was the driving force for their IAQ management plan. Their support began at a principal's meeting in December 2001, in which the Deputy Superintendent committed each school to implementing the Kit. Facilities staff posted electronic versions of the building inspection checklists on the district's Intranet site and regularly reported public IAQ updates on the district's Web site. The district developed a software program to analyze data collected from building checklists and walkthrough inspections. Facilities staff are progressively developing the IAQ program as a tool to implement and support the Preventive Maintenance Program and continues to receive the support of the district administrators for large IAQ projects.
Contact: Robert Sands, (469) 752-0190

Reading School District, Reading, PA

Reading School District has implemented an extensive IAQ communications and outreach effort in each of the district's 19 schools. The district educates school staff, school board officials, community members, parents, and school nurse associations about IAQ issues in schools by distributing EPA's IAQ TfS Kit and supporting materials. The District involved local businesses in an innovative "Adopt a School" program to secure funding for building repairs while providing opportunities for positive recognition for participating organizations. School nurses noticed a decline in the number of student visits to the nurse's office for asthma medication and health complaints after IAQ improvements were made. The IAQ TfS Kit helped Reading School District establish a successful IAQ management program for identifying and resolving IAQ problems, including asbestos, lead, and mold with more aggressive maintenance practices.
Contact: Richard Ascraft, (610) 374-7101

Sharon Public Schools, Sharon, MA

Sharon Public Schools adopted IAQ TfS in June 1998 after the acting IAQ Coordinator learned about the Program at a Massachusetts Teachers Association workshop sponsored by EPA. Since then, the district's IAQ Team, led by the joint health and safety committee, has identified IAQ problems by distributing questionnaires, mapping out problem areas, and collecting building data. After reviewing this information, the Team removed hazardous chemicals, improved the ventilation system, replaced water-damaged tiles, and purchased several HEPA filter vacuum cleaners. To better track IAQ issues, the district created a database that staff can use to report their IAQ-related questions and complaints. The district is also expanding communication efforts by meeting with the school committee to provide IAQ updates and discussing its participation in and successes using IAQ TfS with other school districts.
Contact: Patricia Terrell, (781) 784-1560

Township of Ocean Board of Education, Oakhurst, NJ

With the support of an IAQ Team comprised of several critical members of the school staff, Township of Ocean Board of Education successfully implemented new IAQ procedures. The Team encourages the involvement of faculty members by facilitating monthly meetings and training sessions on the IAQ TfS Program. Improvements have already been documented the school nurse noted a decline in the number of student visits due to asthma-related problems, and teachers and parents have given positive feedback about cleaner classrooms and "fresher" air. The Supervisor of Facilities speaks about IAQ TfS and good IAQ practices at New Jersey Schools Buildings and Grounds Association meetings, and the school nurse teaches a course about implementing the IAQ TfS Program at a local university to school administrators, teachers, nurses, and other health professionals.
Contact: William McKeon, (732)531-5600 ext. 3450

Williamson County School District, Franklin, TN

After its success with the ALA's Open Airways Program, Williamson County School District decided to pilot the IAQ TfS Program. An Allergy & Asthma Network Mothers of Asthmatics (AANMA) volunteer initiated the first step in the IAQ TfS Program with classroom walkthroughs, which led to the development of IAQ-related goals for the maintenance department. These changes included replacing plug-in deodorizers with natural alternatives, limiting the use of pets, and drafting plans for ventilation system replacement. The IAQ Team educated school staff during faculty meetings and coordinated district-wide asthma training during teacher in- service days. The maintenance department played a critical role by creating detailed packets that explained the district IAQ management plan, results of walkthroughs, and reference materials. The Team currently speaks about the program at other schools and to

organizations working to improve IAQ, and is writing an article for a local newspaper describing the success of their pilot program.
Contact: Gail Bost, (615) 794-8727

Special Achievement Awards

Buist Academy for Advanced Studies, Charleston, SC

Students played a pivotal role in launching the IAQ TfS Program at Buist Academy for Advanced Studies. In 2000, a sixth grade class designed a model classroom to demonstrate how the learning environment could be improved. Using checklists provided in the Kit, students, along with staff members, performed walkthroughs to identify areas of primary concern. They focused on window restoration and researched the impacts of natural lighting in classrooms on health, academic performance, and energy costs. The following year's sixth graders continued the project by conducting several months of research to determine alternatives to worn-out carpet in the school. After reviewing the students' report, the school board and PTA approved new window and carpet purchases for the school and used outside funds, including contributions from student fund raisers, local businesses, and manufacturers. Students continue to contribute to the success of the IAQ TfS Program at Buist. They participate in presentations to local youth service organizations and are preparing a video to help other schools implement IAQ TfS. The students' activities have generated positive publicity and interest from organizations and other school districts.
Contact: Mel Goodwin (843) 577-2103

Delaware Joint Vocational School, Delaware, OH

Increasing problems including indoor humidity, carpet maintenance, chemical use, storage, and water intrusion prompted Delaware Joint Vocational School to begin implementing the IAQ TfS Program. Working with the Delaware General Health District and the Ohio Department of Health to implement the Program, the school organized an IAQ Team representing staff from all levels. They then modified the checklists provided in the Kit to meet the specific needs of a vocational school setting comprised of several laboratories and wood working areas. Team members completed checklists and made suggestions to improve building air quality, including using Material Safety Data Sheets to monitor chemicals, replacing damaged or worn carpet with hard surface flooring, repairing roof leaks, and upgrading the HVAC systems. The IAQ Coordinator has presented the team's IAQ Management Plan and the school's success with the IAQ TfS Program at Board of Education meetings and statewide conferences. Delaware Joint Vocational School continues to use the resources provided in the IAQ TfS Kit to help team members identify facility problems, make repairs, and address staff concerns for better communication and a healthier school environment.
Contact: Patrick Deel, (740) 548-0708

East Dubuque Community Unit School District #119, East Dubuque, IL

In Fall 2000, the superintendent and maintenance director for East Dubuque Community Unit School District began conducting IAQ TfS walkthroughs in the school buildings. In May 2002, the Team expanded to include the school nurse, home economics teacher, bus driver, cooks, art teachers, science teachers, and custodians. The nurse currently collects data on asthma-related visits to her office, which will be used to determine trends in asthma and other IAQ-related illnesses in the district before and after IAQ improvements. With the support of the school board, the Team has successfully responded to IAQ issues in the school district and networks with other schools in the region to promote the Program.
Contact: Donald Kussmaul (815) 747-3188 ext. 1105

Nassau County Board of Cooperative Educational Services (BOCES), Westbury, NY

One of the first groups in the United States to become involved with IAQ TfS, Nassau County BOCES coordinates educational, safety, and health services for all schools in Nassau County. This highly respected organization encourages school districts to adopt the IAQ TfS Program and form an IAQ Team and Management Plan. The group provides materials and training on the Kit and effectively communicates with school staff about the Program. Nassau BOCES is in a unique position to provide coordinated educational support services for all schools in the county and partners with key school decision makers. To date, the Board has succeeded in getting 12

schools/districts to implement IAQ TfS and continues to reach out to other Boards of Cooperative Educational Services throughout New York State.
Contact: Peter LaDuca (516) 396-2388

Northwest Air Pollution Authority, Mount Vernon, WA with Washington State University Cooperative Extension, WA

In 2000, EPA grantees Dave Blake, with Northwest Air Pollution Authority, and Rich Prill, with Washington State University Cooperative Extension, developed a condensed training manual, "Indoor Air Quality Tools for Schools Implementation: 3 Easy Steps" as a supplement to the IAQ TfS Kit. They coordinated several free training sessions for school district staff throughout Washington, Oregon, Idaho, and Alaska. During the 2001-2002 school years, Dave Blake and Rich Prill helped more than 240 schools implement the IAQ TfS Program. They received extended funding from their organizations to continue the project and market the training booklet at the Washington State National Environmental Health Association Conference and the Northwest Energy Efficiency Council's Building Operator Certification courses attended by school facilities staff. They started an IAQ newsletter, which is shared with schools throughout the region, and they continue to provide effective training to help school staff address IAQ complaints and community concerns.
Contact: Dave Blake, (360) 428-1617 or Rich Prill, (509) 477-6701

San Francisco Unified School District IAQ Policy Implementation Committee, San Francisco, CA

San Francisco Unified School District (SFUSD) began working with EPA's Region 9 San Francisco Office in 1998 to address community concerns over rising asthma rates in district schools. SFUSD formed an IAQ Policy Implementation Committee to conduct building walkthroughs, identify sources of IAQ problems contributing to the rise in asthma cases, and establish maintenance guidelines to improve the condition of school facilities. The school nurse participating in the Team tracks health complaints submitted by district schools and recently reported that the use of asthma inhalers decreased dramatically after IAQ improvements were made. Committee members participate in the district's planning process and attend school staff meetings where they promote the IAQ TfS Program. To date, SFUSD has performed walkthroughs in 15 of the 20 schools participating in the program and is committed to continuing walkthroughs and completing building improvements.
Contact: Hene Kelly, (415) 386-0334 or John Bitoff, (415) 695-5925

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